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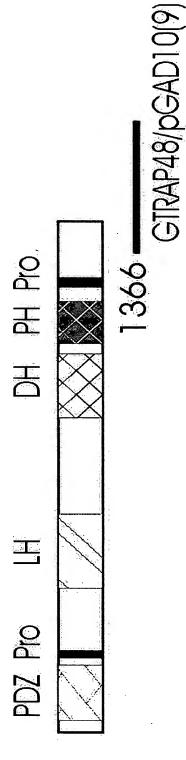
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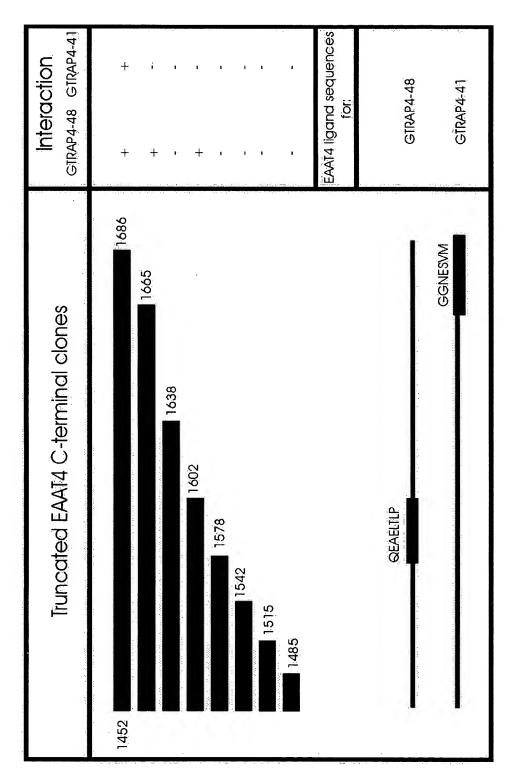
FIGURE 1A

Actin binding spectrin repeats PH

1730 2158

GTRAP41/pGAD10(8)

FIGURE 1B

PDZ Pro LH DH PH Pro.

1366

GTRAP48/pGAD10(9)

FIGURE 2

	Interaction	
	GTRAP4-48	GTRAP4-41
1686	+	+
1665	+	-
1638	-	-
1602	+	-
1578	-	-
1542	-	-
1515	-	-
1485	-	-

Truncated EAAT4 C-terminal clones

EAAT4 ligand sequences for:
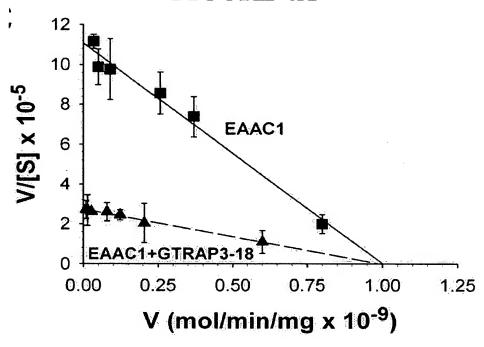
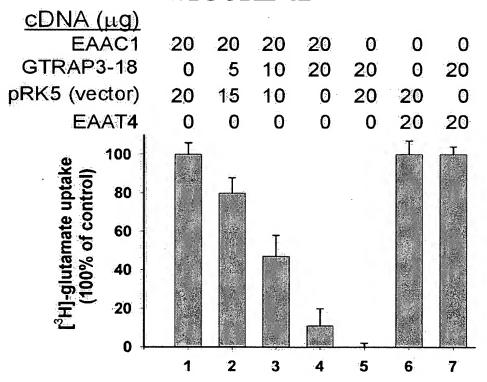|	
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GGNESVM	GTRAP4-41
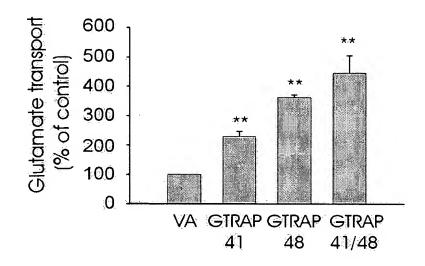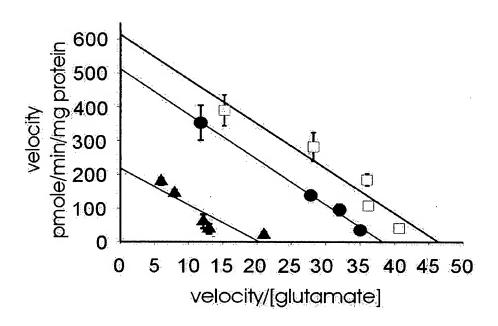
FIGURE 3A

FIGURE 3B

FIGURE 4A

FIGURE 4B

cDNA (μg)

EAAC1	20	20	20	20	0	0	0
GTRAP3-18	0	5	10	20	20	0	20
pRK5 (vector)	20	15	10	0	20	20	0
EAAT4	0	0	0	0	0	20	20

FIGURE 5A

Total

FIGURE 5B

FIGURE 6A

Glutamate transport (% of control)

400
300
200
100
0

*

VA   GTRAP48   GTRAP48
ΔCOOH

FIGURE 6B

Glutamate transport (% of control)

120
100
80
60
40
20
0

**

GTRAP48   GTRAP48+   GTRAP48+
1452-1578   1452-1686

FIGURE 6C

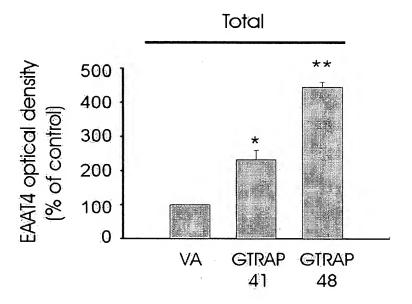Glutamate transport (% of control)

200
150
100
50
0

*   *

HSV   HSV/   HSV/
GTRAP48   GTRAP41

FIGURE 7A
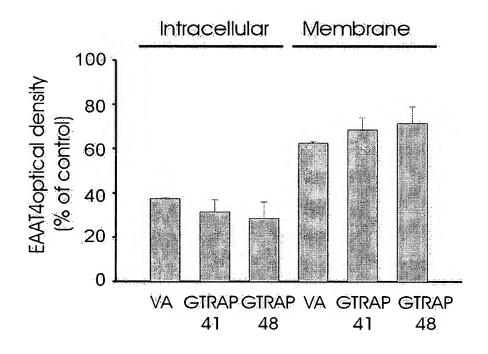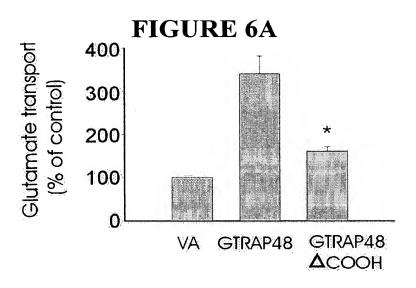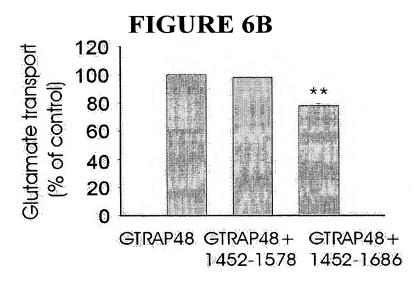

FIGURE 7B

FIGURE 8A

GTRAP3-18 antisense oligonucleotide (μM)

FIGURE 8B

FIGURE 8C
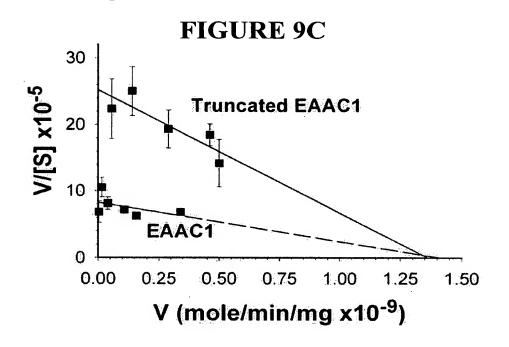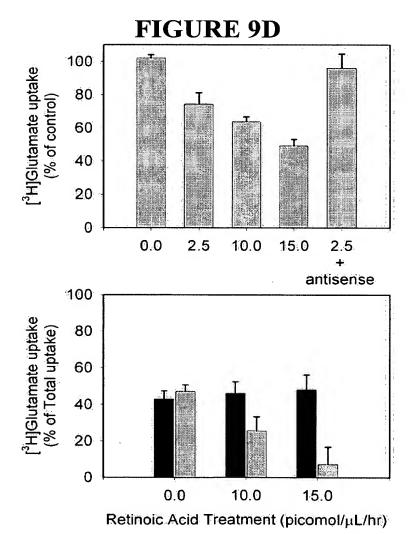
FIGURE 9A

FIGURE 9B

FIGURE 9C

FIGURE 9D

FIGURE 9E

125A

125B

125C

100

COMPUTER SYSTEM

105

PROCESSOR

110

INTERNAL STORAGE

115

MEMORY

118

DATA RETRIEVING DEVICE

120

DISPLAY

FIGURE 10

200

201 START

202 STORE NEW SEQUENCE TO A MEMORY

204 OPEN DATABASE OF SEQUENCES

206 READ FIRST SEQUENCE IN DATABASE

210 PERFORM COMPARISON OF NEW SEQUENCE AND STORED SEQUENCE

212 SAME?

224 GO TO NEXT SEQUENCE IN DATABASE

NO

YES

214 DISPLAY STORED SEQUENCE NAME TO USER

218 MORE SEQUENCES IN DATABASE?

YES

NO

220 END

FIGURE 11

FIGURE 12

300

302

START

304
STORE A FIRST SEQUENCE TO A MEMORY

306
OPEN A DATABASE OF SEQUENCE FEATURES

308
READ FIRST FEATURE FROM DATABASE

310
COMPARE FEATURE ATTRIBUTES WITH THE FIRST SEQUENCE

316
FOUND?

YES

318
DISPLAY FOUND FEATURE TO THE USER

NO

326
READ NEXT FEATURE IN DATABASE

320
MORE FEATURES IN DATABASE?

YES

NO

324
END

FIGURE 13

FIGURE 14A

```
ATGAGCAGCACCCTGTCACCCACTGACTTCGACAGCTTGGAGATCCAGGGCCAGTACAGTGA
CATCAACAACCGCTGGGACCTGCCCGACTCAGATTGGGACAATGACAGCAGTTCAGCCCGCC
TCTTTGAGAGGTCCAGAATTAAGGCCCTGGCAGATGAGCGAGAAGCCGTGCAGAAGAAACC
TTCACCAAGTGGGTGAACTCCCACCTGGCCCGGGTGACATGCCGGGTGGGAGACCTGTACAG
CGACCTGCGGGACGGGCGCAACCTCCTGAGGCTCCTGGAGGTGCTCTCGGGAGAGACCCTGC
CAAAAACCCACCAAGGGCCGGATGCGGATTCACTGCCTGGAGAATGTCGACAAAGCACTGCAG
TTCCTGAAGGAGCAGAAGGTGCACCTGGAAAACATGGGCTCCCACGACATTGTGGATGGGAA
CCACCGTCTGACCCTTGGGCTAGTGTGGACCATCATCCTCCGATTTCAGATCCAAGACATCA
GTGTGGAGACAGAAGACAACAAGGAGAAGAAGTCAGCCAAGGATGCCCTGCTGCTGTGGTGC
CAGATGAAGACTGCAGGGTATCCCAATGTCAATGTGCACAACTTTACCACCAGTTGGAGAGA
TGGGCTGGCCTTTAATGCCATTGTGCACAAACACCGGCCAGACCTGTTGGATTTTGAGTCCC
TGAAGAAGTGTAACGCACACTACAATCTGCAGAATGCTTTCAATCTGGCTGAAAAGGAACTT
GGCCTGACGAAGCTCCTGGATCCTGAAGATGTGAACGTAGACCAACCCGATGAGAAGTCCAT
CATCACCTACGTGGCCACTTACTACCACTACTTCTCGAAGATGAAGGCCCTGGCTGTGGAAG
GCAAAAGGATTGGCAAGGTCCTGGACCATGCCATGGAGGCAGAACACCTGGTAGAGAAATAT
GAGTCCCTGGCCTCTGAACTGCTGCAGTGGATCGAGCAAACGATTGGGACCTTCAATGACCG
ACAGCTGGCCAACTCCCTGAGTGGCGTCCAGAACCAGCTGCAGTCTTTCAATTCCTACCGCA
CGGTGGAGAAGCCACCCAAGTTCACAGAGAAAGGGAACTTGGAGGTGTTGCTCTTCACCATC
CAGAGTAAGCTGCGGGCCAACAACCAGAAAGTCTACACACCACGCGAAGGCCGGCTCATCTC
GGACATCAACAAGGCCTGGGAGCGGCTAGAGAAAGCCGAACATGAGCGAGAGCTGGCCCTGC
GCACGGAGCTGATCCGCCAGGAGAAGCTGGAGCAACTGGCTGCTCGCTTCGACCGCAAGGCT
GCCATGCGGGAGACCTGGCTCAGTGAGAACCAGCGCCTCGTCTCCCAGGACAACTTTGGCCT
GGAGCTGGCAGCAGTGGAGGCAGCAGTGCGGAAGCATGAAGCCATTGAGACAGACATTGTGG
CCTACAGCGGCCGGGTGCAAGCGGTGGACGCCGTAGCCGCAGAACTGGCCGCTGAGCATTAC
CATGACATTAAGCGCATTGCGGCGCGGCAGAACAACGTGGCCCGGCTCTGGGACTTCTTACG
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AGGACCTGCTCTACCTCATGGACTGGATGGCAGAGATGAAGGGCCGGCTGCAGTCTCAGGAC
CTAGGCAAGCATCTGGCTGGAGTGGAAGATCTACTGCAACTACACGAACTGGTGGAGGCGGA
CATTGCAGTTCAGGCTGAGAGGGTGCGAGCGGTCAGCGCCTCTGCCCTGCGCTTCTGCGACC
CAGGGAAAGAGTATAGACCTTGCGGCCCGCAGCTAGTGTCAGAGAGGGTAGCCACTCTGGAG
CAGAGCTATGAGGCCCTGTGCGAATTGGCAGCAACTCGAAGGGCCCGACTGGAAGAGTCCCG
TCGTCTCTGGAGGTTCCTCTGGGAAGTGGGTGAGGCCGAGGCCTGGGTTCGGGAGCAGCAGC
ACCTCCTGGCCTCAGCTGAGACAGGCCGGGACCTGACTGGTGTCCTCCGCCTGCTCAATAAG
CACACAGCCCTACGGGGTGAGATGAGTGGCCGCCTGGGGCCCCTGAAGCTCACCCTGGAACA
AGGTCAGCAGTTAGTTGCCGAGGGCCACCCTGGAGCTAACCAAGCCTCAACCCGTGCAGCAG
AGCTCCAGGCCCAGTGGGAGCGACTAGAAGCCCTGGCCGAGGAGCGAGCCCAGCGGCTAGCA
CAGGCTGCCAGCCTCTACCAGTTCCAGGCAGATGCCAATGACATGGAGGCTTGGTTGGTGGA
CGCACTACGCCTGGTATCTAGCCCTGAGGTAGGGCACGATGAGTTCTCCACGCAGGCCCTGG
CCAGGCAGCACAGGGCCCTTGAGGAGGAGATCCGAGCCCACCGGCCTACACTGGATGCCTTG
AGGGAGCAGGCTGCAGCCCTGCCACCTGCACTGAGCCACACACCTGAGGTACAGGGCAGGGT
GCCCACTCTGGAGCAGCACTATGAGGAGCTGCAGGCCCGGGCAGGTGAGCGTGCACGAGCCC
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GAGGAGAAGGAGCAGTGGCTCAACGGGCTGGCCCTACCTGAGCGCCTGGAGGACCCGGAGGT
GGTCCAACAGAGGTTTGAGACCTTAGAGCCCGAAATGAACGCCCTGGCTGCACGGATTACTG
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GGCACCCAGGAGCAGCTCAACCAAAGGTGGCAGCAGTTCAGGTCCCTGGCAGGTGGCAAAAA
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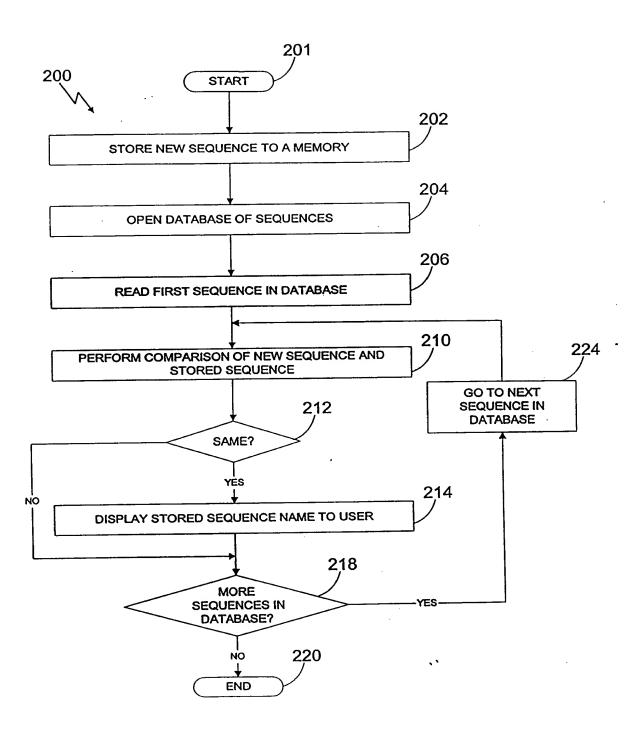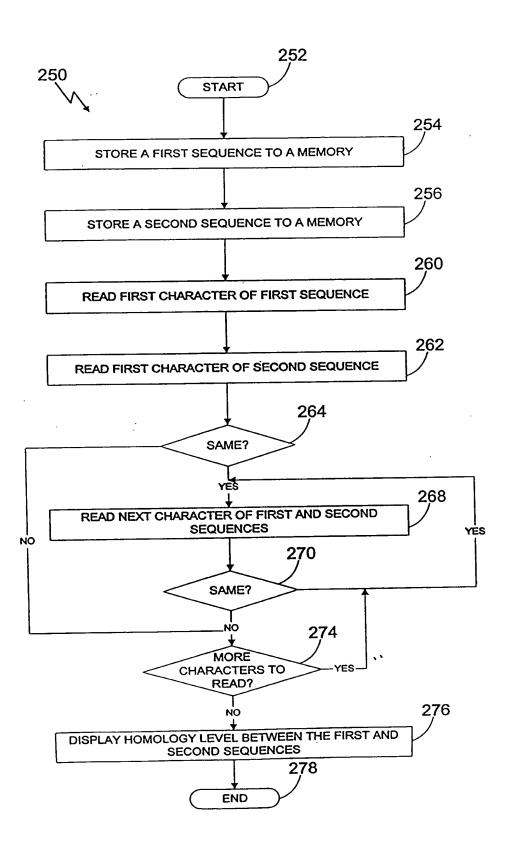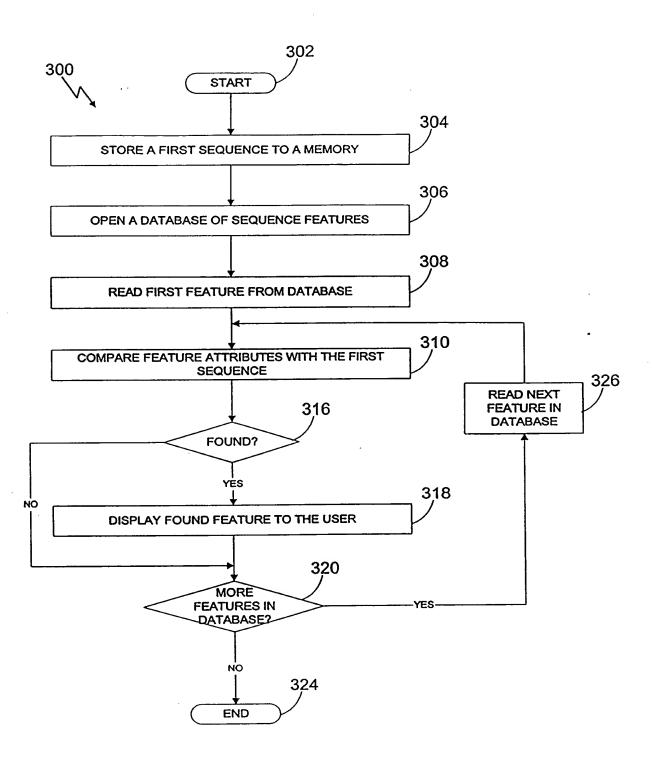
FIGURE 14B

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GGTGTGCTGGCCCTGCAGCGGAAGCTGGCAGGCACTGAGAGAGATCTGGAAGCCATCTCTGC
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CTGCCATCAACACACGGCTTGGAGAGGTTCAAACTGGATGGGAGGATCTTCGGGCAACCATG
AGGCGGAGAGAAGAGTCCCTGGGTGAGGCTCGACGGCTGCAAGATTTCCTGCGCAGCTTAGA
TGACTTCCAGGCCTGGCTAGGCCGCACACAGACTGCTGTAGCCTCTGAGGAAGGACCAGCCA
CCCTTCCAGAGGCAGAAGCCCTCTTAGCCCAGCATGCAGCTCTGCGGGGAGAGGTGGAGAGA
GCCCAGAGCGAGTACAGCCGCCTCAGGACCTTGGGCGAGGAGGTGACCAGAGACCAGGCTGA
TCCCCAATGCCTCTTCCTCAGACAGAGGCTGGAAGCCCTTGGAACCGGCTGGGAGGAGCTGG
GTCGCATGTGGGAGAGCCGGCAAGGCCGCTTGGCCCAAGCCCATGGCTTCCAGGGGTTTTTG
AGAGATGCTCGCCAGGCTGAGGGAGTTCTCAGCAGCCAGGAATATGTTCTGTCTCACACGGA
GATGCCAGGGACACTGCAGGCGGCGGATGCAGCCATTAAAAAGCTGGAAGACTTCATGAGCA
CCATGGACGCCAATGGAGAGCGCATCCGTGGACTCCTGGAGGCTGGCCGTCAGCTGGTGTCC
AAGGGCAATATCCATGCTGAGAAGATCCAAGAGAAGGCAGACTCCATCGAGAAGAGGCACAG
AAAGAACCAGGAGGCCGTGCAGCAGCTTCTAGGCCGCCTTCGGGACAACCGAGAGCAGCAGC
ACTTCTTGCAAGACTGTCAGGAGCTGAAACTCTGGATTGACGAGAAGATGCTGACAGCTCAG
GATGTGTCCTATGATGAGGCACGCAACCTGCACACCAAGTGGCAAAAACACCAGGCATTCAT
GGCCGAGCTGGCAGCCAACAAGGACTGGCTGGACAAAGTGGACAAGGAAGGGCGGGAGCTGA
CTCTTGAAAAGCCAGAACTCAAAGTCCTAGTGTCAGAGAAGCTGGAGGACCTGCACAGGCGC
TGGGATGAACTGGAGACTACCACCCAAGCCAAGGCCCGCAGTCTTTTTGATGCTAACCGGGC
AGAGCTATTTGCCCAAAGCTGTTCTGCCCTGGAGAGCTGGCTGGAGAGCCTGCAGGCCCAGC
TGCACTCAGATGACTATGGCAAGGACCTCACCAGTGTCAACATTCTGCTAAAGAAGCAACAG
ATGCTGGAACGAGAGATGGCTGTGAGAGAGAAGGAGGTAGAGGCTATCCAGGCCCAGGCAAA
AGCCCTGGCCCAGGAAGACCAAAGTGCAGGAGAGGTGGAAAGGACCTCCAGAGCTGTGGAGG
AGAAGTTCAGGGCCTTGTGTCAGCCCATGAAGGACCGCTGCCGGCGCCTGCAAGCCTCCCGA
GAGCAGCACCAGTTCCACCGGGATGTGGAGGATGAGATACTGTGGGTGACCGAGCGGCTTCC
CATGGCCAGCTCTCTGGAGCATGGCAAGGACTTGCCCAGCGTCCAGCTTCTCATGAAGAAAA
ACCAGACTCTGCAGAAGGAGATCCAGGGCCATGAGCCCCGGATTGCAGACCTCAAAGAGAGG
CAGCGCACTCTGAGAACAGCAGCAGCGGGTCCAGAGCTGGCTGAGCTCCAGGAAATGTGGAA
ACGCCTGAGCCATGAGCTGGAGCTTCGGGGTAAACGACTGGAGGAGGCCCTTCGAGCCCAGC
AATTCTATCGTGACGCTGCAGAGGCCGAGGCTTGGATGGGGGAGCAGGAGTTACATATGATG
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AGAACAAGCCCTTGCTGACTATGCCCAGACCATCAAACAACTAGCAGCCAGCAGTCAAGATA
TGATTGACCATGAACATCCAGAGAGCACAAGGTTAACAATACGCCAAGCCCAGGTGGACAAG
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GCTGTGCCAGCTCCGCAGAGAGCTGGATGACCTGGAGCAGTGGATACAGGAGCGAGAAGTCG
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GGCCAATGGGCTCATTGCTGGGGGCCATGCTGCATGGGCCACCGTGGCCGAGTGGAAGGACA
GTCTCAATGAGGCCTGGGCTGACCTGCTGGAGCTGCTGGACACAAGAGGTCAGGTGCTGGCT
GCTGCTTATGAGCTGCAGCGCTTCCTGCATGGGCCCGCCAAGCCCTGGCACGGGTGCAGCA
CAAGCAGCAGCAGCTTCCAGATGGGACGGGCCGCGACCTCAATGCTGCTGAGGCCCTGCAGC
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GACGATGGCCTCAGGCTACAAAAGGCCTATGCTGGAGACAAGGCTGAGGAAATTGGCCGTCA
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CCGCCTGCATTGACATGGGGCAAGAGCTGCTGGCCCGGAACCACTATGCCGCTGAGGAGATC
```

FIGURE 14C

```
TCAGAGAAGCTGTCTCAGCTACAGTCCCGGCGCCAGGAGACAGCTGAAAAGTGGCAGGAGAA
GATGGACTGGCTACAGCTTGTTTTGGAGGTGCTTGTGTTTGGGAGAGATGCAGGCATGGCAG
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GCGTTTCAGTGCCCTGGAGAAGCTCACTGCGCTGGAAGAGCGGGAGAATGAGCAGAAAAGGA
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GTCTTCAAGCTGGGCTTGCAGGATGGGAAAGAGTATCTATTCCAGGCCAAGGATGAGGCAGA
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AGCCAGAAGAGCCAGTGGTGCCCAGTGCCAGCCGGGGTCTGACCAGGGCCATGACCATGCCC
CCAGTGTCACAGCCTGAGGGCTCCATCGTGCTTCGCAGCAAGGATGGCAGAGAAAGAGAGCG
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CCCTCCCTCTGTTCAGGAAACTGCCAGGGACTGTCGACAGAGACCACC
```

FIGURE 15

MSSTLSPTDFDSLEIQGQYSDINNRWDLPDSDWDNDSSSARLFERSRIKALADEREA
VQKKTFTKWVNSHLARVTCRVGDLYSDLRDGRNLLRLLEVLSGETLPKPTKGRMRIHCLENV
DKALQFLKEQKVHLENMGSHDIVDGNHRLTLGLVWTIILRFQIQDISVETEDNKEKKSAKDA
LLLWCQMKTAGYPNVNVHNFTTSWRDGLAFNAIVHKHRPDLLDFESLKKCNAHYNLQNAFNL
AEKELGLTKLLDPEDVNVDQPDEKSIITYVATYYHFSKMKALAVEGKRIGKVLDHAMEAEH
LVEKYESLASELLQWIEQTIGTFNDRQLANSLSGVQNQLQSFNSYRTVEKPPKFTEKGNLEV
LLFTIQSKLRANNQKVYTPREGRLISDINKAWERLEKAEHERELALRTELIRQEKLEQLAAR
FDRKAAMRETWLSENQRLVSQDNFGLELAAVEAAVRKHEAIETDIVAYSGRVQAVDAVAAEL
AAEHYHDIKRIAARQNNVARLWDFLREMVAARRERLLLNLELQKVFQDLLYLMDWMAEMKGR
LQSQDLGKHLAGVEDLLQLHELVEADIAVQAERVRAVSASALRFCDPGKEYRPCGPQLVSER
VATLEQSYEALCELAATRRARLEESRRLWRFLWEVGEAEAWVREQQHLLASAETGRDLTGVL
RLLNKHTALRGEMSGRLGPLKLTLEQGQQLVAEGHPGANQASTRAAELQAQWERLEALAEER
AQRLAQAASLYQFQADANDMEAWLVDALRLVSSPEVGHDEFSTQALARQHRALEEEIRAHRP
TLDALREQAAALPPALSHTPEVQGRVPTLEQHYEELQARAGERARALEAALAFYTMLSEAGA
CGLWVEEKEQWLNGLALPERLEDPEVVQQRFETLEPEMNALAARITAVSDIAEQLLKASPPG
KDRIIGTQEQLNQRWQQFRSLAGGKKAALTSALSIQNYHLCETETQAWMREKTKVIESTQDL
GNDLAGVLALQRKLAGTERDLEAISARVGELTQEANALAAGHPAQAPAINTRLGEVQTGWED
LRATMRRREESLGEARRLQDFLRSLDDFQAWLGRTQTAVASEEGPATLPEAEALLAQHAALR
GEVERAQSEYSRLRTLGEEVTRDQADPQCLFLRQRLEALGTGWEELGRMWESRQGRLAQAHG
FQGFLRDARQAEGVLSSQEYVLSHTEMPGTLQAADAAIKKLEDFMSTMDANGERIRGLLEAG
RQLVSKGNIHAEKIQEKADSIEKRHRKNQEAVQQLLGRLRDNREQQHFLQDCQELKLWIDEK
MLTAQDVSYDEARNLHTKWQKHQAFMAELAANKDWLDKVDKEGRELTLEKPELKVLVSEKLE
DLHRRWDELETTTQAKARSLFDANRAELFAQSCSALESWLESLQAQLHSDDYGKDLTSVNIL
LKKQQMLEREMAVREKEVEAIQAQAKALAQEDQSAGEVERTSRAVEEKFRALCQPMKDRCRR
LQASREQHQFHRDVEDEILWVTERLPMASSLEHGKDLPSVQLLMKKNQTLQKEIQGHEPRIA
DLKERQRTLRTAAAGPELAELQEMWKRLSHELELRGKRLEEALRAQQFYRDAAEAEAWMGEQ
ELHMMGQEKAKDELSAQAEVKKHQVLEQALADYAQTIKQLAASSQDMIDHEHPESTRLTIRQ
AQVDKLYAGLKELAGERRERLQEHLRLCQLRRELDDLEQWIQEREVVAASHELGQDYEHVTM
LRDKFREFSRDTSTIGQERVDSANALANGLIAGGHAAWATVAEWKDSLNEAWADLLELLDTR
GQVLAAAYELQRFLHGARQALARVQHKQQQLPDGTGRDLNAAEALQRRHCAYEHDIQALSTQ
VQQVQDDGLRLQKAYAGDKAEEIGRHMQAVAEAWAQLQGSSAARRQLLLDTTDKFRFFKAVR
ELMLWMDGINLQMDAQERPRDVSSADLVIKNQQGIKAEIEARADRFSACIDMGQELLARNHY
AAEEISEKLSQLQSRRQETAEKWQEKMDWLQLVLEVLVFGRDAGMAEAWLCSQEPLVRSAEL
GCTVDEVSLIKRHEAFQKSAVAWEERFSALEKLTALEERENEQKRKREEEERRKQPPTSEPM
ASQPEGSLVDGQRVLDTAWDGTQSKLPPSTQAPSINGVCTDTESSQPLLEQQRLEQSNVPEG
PGSGTGDESSGPRGERQTLPRGPAPSPMPQSRSSESAHVATLPARGAELSAQEQMEGTLCRK
QEMEAFNKKAANRSWQNVYCVLRRGSLGFYKDARAASAGVPYHGEVPVSLARAQGSVAFDYR
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MTMPPVSQPEGSIVLRSKDGREREREKRFSFFKKNK.

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ACCAATAGCTCACACCTGGAGGTGGTAAAGCTTATCAAATCTGGCGCCTATGCTGCG
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TTGCAGGCTGAAATTGACCTACGCCTGCGGAACAATGAGGACCCTCGCAATGTGCTC
TGTGAAGCTCAGGAGGCAGTCATGCTGGAAATCCAGGAGCAGATCAACGACTACAGA
TCCAAGCGTACTCTGGGCCTGGGCAGCCTCTATGGTGAAAATGACCTGCTAGGCCTG
GATGGGGACCCTCTTCGAGAACGCCAAATGGCTGAGAAGCAGCTGGCTGCCCTTGGA
GATATCTTGTCCAAATATGAGGAAGATCGGAGTGCCCCCATGGACTTTGCTGTTAAT
ACCTTTATGAGCCACGCTGGGATCCGTCTTCGGGAGTCTCGATCCTCCTGCACGGCA
GAAAAGACCCAGTCTGCCCCTGACAAGGACAAGTGGCTGCCCTTCTTCCCTAAGACC
AAGAAGCAGAGCAGCAATTCCAAGAAAGAAAGGATGCCTTGGAGGACAAGAAGCGA
AACCCCATCCTCAGATATATTGGGAAGCCCAAGAGCTCCTCTCAGAGCATTAAGCCA
GGCAATGTGAGGAACATCATTCAGCACTTTGAGAACAGCCATCAGTATGATGTCCCA
GAGCCGGGGACACAACGACTCTCAACAGGAAGCTTTCCTGAGGACCTGCTGGAGAGT
GACAGTTCGCGCTCAGAGATTCGACTGGGCCGCTCTGGGAGCCTCAAGGGCCGGGAA
GAGATGAAGCGATCCCGGAAAGCAGAGAACGTGCCCCGGCCTCGAAGTGACGTTGAC
ATGGATGCTGCTGCAGAGGCTGCCCGCCTTCACCAGTCAGCCTCGTCCTCTGCCTCC
AGCCTCTCCACCAGGTCTCTTGAGAACCCAACCCCTCCCTTCACCCCCAAAATGGGC
CGCAGGAGCATTGAGTCCCCAATCTGGGGTTCTGTACAGACGTCATCCTTCCCCAC
CTCCTGGAGGATGATCTGGGCCAATTGTCTGACCTGGAGCCAGAGCCAGAGGTCCAA
AACTGGCAGCATACAGTAGGCAAGGATGTGGTGGCCAACCTGACCCAGAGGGAAATT
GACCGGCAAGAGGTCATCAATGAGCTTTTTGTGACAGAAGCATCTCACCTGCGCACA
CTCCGAGTCCTGGACCTCATCTTCTACCAGCGCATGAGAAAGGAGAACCTAATGCCT
CGGGAAGAGCTAGCGCGGCTCTTCCCTAACCTGCCTGAGCTCATAGAGATTCACAAT
TCCTGGTGTGAGGCCATGAAGAAGCTCCGGGAGGAGGGCCCCATTATCAGAGACATC
AGTGACCCCATGCTGGCTCGGTTTGATGGTCCTGCCCGAGAAGAACTCCAGCAAGTA
GCTGCACAATTCTGTTCCTATCAGTCAGTAGCCCTAGAGCTAATCAGGACTAAGCAA
CGTAAGGAGAGTCGGTTCCAGCTCTTCATGCAGGAGGCTGAGAGCCACCCTCAGTGC
CGGCGTCTGCAGCTCCGAGACCTCATCGTCTCTGAAATGCAACGGCTCACCAAGTAC
CCACTGCTGCTAGAGAACATCATCAAGCACACAGAGGGTGGCACCTCTGAGCATGAG

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AAGCTCTGCCGTGCCCGGGACCAGTGCCGGGAGATTCTCAAGTTTGTGAATGAAGCA
GTAAAGCAGACAGAGAACCGCCACCGGCTAGAGGGGTACCAGAAACGCCTGGATGCC
ACTGCCCTAGAGCGGGCCAGCAACCCCTTGGCAGCAGAGTTCAAGAGCCTGGATCTT
ACAACAAGGAAGATGATCCACGAGGGGCCTCTGACCTGGAGGATCAGCAAAGACAAG
ACCCTGGACCTCCAGGTGCTTCTGCTTGAGGACCTGGTGGTACTGCTGCAGAGACAA
GAGGAGCGGCTGCTGCTAAAGTGCCACAGCAAGACAGCCGTGGGCTCCTCCGACAGC
AAGCAGACGTTCAGCCCTGTGCTGAAGCTCAATGCTGTGCTCATCCGCTCCGTGGCT
ACAGACAAGCGAGCCTTCTTCATCATCTGCACCTCCGAGCTGGGCCCTCCCCAGATC
TATGAGCTGGTTGCATTGACGTCATCAGACAAGAATATATGGATGGAGCTCTTAGAA
GAGGCCGTGCAGAATGCCACCAAGCACCCTGGAGCTGCCCCAATCCCCATCCATCCC
TCACCACCAGGATCCCAGGAGCCGGCCTACCAGGGCTCCACCTCCAGCAGGGTAGAA
ATAAATGACTCAGAAGTATATCACACTGAAAAAGAACCCAAGAAGCTACCTGAAGGC
CCCGGGCCTGAGCAGAGAGTTCAAGACAAGCAGCTGATAGCACAAGGGGAGCCTGTG
CAGGAAGAGGATGAAGAGGAATTGAGGACCTTGCCTCGAGCTCCCCCCTCCCTGGAT
GGAGAAAACAGAGGCATCAGGACAAGGGACCCTGTCCTTCTGGCCCTCACAGGCCCT
CTGCTCATGGAGGGACTTGCTGATGCTGCCCTGGAAGATGTGGAGAACTTGCGTCAC
CTGATCCTGTGGAGCCTGCTGCCTGGTCACACTGTGAAGACTCAGGCTGCTGGCGAG
CCTGAGGATGACCTCACACCCACCCCTTCTGTCGTGAGCATCACCTCTCACCCCTGG
GACCCAGGGTCCCCAGGGCAAGCTCCCACCATAAGTGACAGCACCCGACTTGCGAGG
CCAGAGGGCAGCCAGCCAGAGGGCGAGGATGTTGCTGTCAGTTCTCTGGCACACCTG
CCGCCAAGGACCAGAAGTTCTGGCGTCTGGGACTCTCCTGAGCTGGATAGGAATCCG
GCTGCAGAGGCTGCAAGCACAGAACCAGCAGCAAGTTACAAGGTTGTGAGAAAAGTC
TCTCTACTCCCTGGTGGTGGTGTCGGTGCAGCCAAGGTGGCGGGCAGCAATGCTATC
CCTGACAGTGGCCAGTCAGAATCTGAGCTATCTGAAGTGGAAGGCGGAGCACAGGCT
ACGGGGAACTGTTTCTATGTCAGCATGCCAGCAGGACCTCTGGACTCCAGCACTGAG
CCTACTGGGACACCCCCAAGCCCCTCACAGTGTCACAGCCTCCCTGCATGGCCAACA
GAGCCTCAGCCCTACAGGGGAGTCCGTGGGGGTCAGTGTTCCAGCCTGGTCCGCAGG
GATGTGGATGTGATCTTCCATACCATCGAGCAGCTCACCATCAAGCTTCACAGACTG
AAGGACATGGAGCTGGCCCACAGAGAGCTGCTCAAGTCCCTTGGAGGAGAGTCATCG
GGTGGAACCACACCTGTGGGGAGTTTTCACACAGAGGCAGCCAGATGGACAGACTAC
TCCCTCTCCTCCAGCCAAGGAAGCCCTGGCCTCTGATTCCCAAAATGGTCAGGAG
CAGGGGTCCTGCCCTGAAGAAGGCTCCGACATCGCCCTGGAAGACAGTGCCACTGAC
ACAGCTGTGTCACCAGGACCATAG
```

FIGURE 17

MSIRLPHSIDRSASKKQSHLSSPIASWLSSLSSLGDSTPERTSPSHHRQPSDTSETTAG
LVQRCVIIQKDQHGFGFTVSGDRIVLVQSVRPGGAAMKAGVKEGDRIIKVNGTMVTNSS
HLEVVKLIKSGAYAALTLLGSSPPSVGVSGLQQNPSVAGVLRVNPIIPPPPPPPPLPPP
QHITGPKPLQDPEVQKHATQILWNMLRQEEEELQDILPPCGETSQRTCEGRLSVDSQEA
DSGLDSGTERFPSISESLMNRNSVLSDPGLDSPQTSPVILARVAQHHRRQGSDAALLPL
NHQGIDQSPKPLIIGPEEDYDPGYFNNESDIIFQDLEKLKSHPAYLVVFLRYILSQADP
GPLLFYLCSEVYQQTNPKDSRSLGKDIWNIFLEKNAPLRVKIPEMLQAEIDLRLRNNED
PRNVLCEAQEAVMLEIQEQINDYRSKRTLGLGSLYGENDLLGLDGDPLREROMAEKQLA
ALGDILSKYEEDRSAPMDFAVNTFMSHAGIRLRESRSSCTAEKTQSAPDKDKWLPFFPK
TKKQSSNSKKEKDALEDKKRNPILRYIGKPKSSSQSIKPGNVRNIIQHFENSHQYDVPE
PGTQRLSTGSFPEDLLESDSSRSEIRLGRSGSLKGREEMKRSRKAENVPRPRSDVDMDA
AAEAARLHQSASSSASSLSTRSLENPTPPFTPKMGRRSIESPNLGFCTDVILPHLLEDD
LGQLSDLEPEPEVQNWQHTVGKDVVANLTQREIDRQEVINELFVTEASHLRTLRVLDLI
FYQRMRKENLMPREELARLFPNLPELIEIHNSWCEAMKKLREEGPIIRDISDPMLARFD
GPAREELQQVAAQFCSYQSVALELIRTKQRKESRFQLFMQEAESHPQCRRLQLRDLIVS
EMQRLTKYPLLLENIIKHTEGGTSEHEKLCRARDQCREILKFVNEAVKQTENRHRLEGY
QKRLDATALERASNPLAAEFKSLDLTTRKMIHEGPLTWRISKDKTLDLQVLLLEDLVVL
LQRQEERLLLKCHSKTAVGSSDSKQTFSPVLKLNAVLIRSVATDKRAFFIICTSELGPP
QIYELVALTSSDKNIWMELLEEAVQNATKHPGAAPIPIHPSPPGSQEPAYQGSTSSRVE
INDSEVYHTEKEPKKLPEGPGPEQRVQDKQLIAQGEPVQEEDEEELRTLPRAPPSLDGE
NRGIRTRDPVLLALTGPLLMEGLADAALEDVENLRHLILWSLLPGHTVKTQAAGEPEDD
LTPTPSVVSITSHPWDPGSPGQAPTISDSTRLARPEGSQPEGEDVAVSSLAHLPPRTRS
SGVWDSPELDRNPAAEAASTEPAASYKVVRKVSLLPGGGVGAAKVAGSNAIPDSGQSES
ELSEVEGGAQATGNCFYVSMPAGPLDSSTEPTGTPPSPSQCHSLPAWPTEPQPYRGVRG
GQCSSLVRRDVDVIFHTIEQLTIKLHRLKDMELAHRELLKSLGGESSGGTTPVGSFHTE
AARWTDYSLSPPAKEALASDSQNGQEQGSCPEEGSDIALEDSATDTAVSPGP.

FIGURE 18

ATGGACGTGAACCTTGCCCCGCTCCGTGCCTGGGATGATTTCTTCCCGGGCTCTGATCG
TTTCGCACGGCCGGACTTCAGGGATATATCCAAATGGAACAACCGTGTAGTGAGCAATC
TGCTCTATTACCAGACCAACTACCTGGTGGTGGCTGCCATGATGATTTCAGTCGTTGGG
TTTCTGAGCCCCTTCAACATGATCCTTGGAGGAATCATTGTGGTGCTGGTGTTCACGGG
GTTTGTGTGGGCAGCACACAATAAAGACATCCTCCGCCGGATGAAGAAGCAGTACCCAA
CGGCCTTTGTCATGGTGGTCATGCTAGCCAGCTACTTCCTCATATCCATGTTTGGGGGT
GTCATGGTCTTTGTGTTTGGCATCACGTTTCCCTTATTGTTGATGTTCATCCATGCATC
CCTGAGACTTCGAAACCTCAAGAACAAACTGGAAAATAAAATGGAGGGAATAGGCTTGA
AGAAAACGCCGATGGGCATCATCCTGGATGCCTTGGAACAGCAGGAAGACAGCATCAAT
AAATTTGCTGACTACATCAGCAAAGCCAGGGAGTAA

FIGURE 19

MDVNLAPLRAWDDFFPGSDRFARPDFRDISKWNNRVVSNLLYYQTNYLVVAAMMISVVG
FLSPFNMILGGIIVVLVFTGFVWAAHNKDILRRMKKQYPTAFVMVVMLASYFLISMFGG
VMVFVFGITFPLLLMFIHASLRLRNLKNKLENKMEGIGLKKTPMGIILDALEQQEDSIN
KFADYISKARE

FIGURE 20A

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   1 gttggccacc atggggatgt accaagtgag actgtaggga aagaaggtgg tgactcgcgt
  61 gcctggctac tggctgctgc tcacctcgat gctacaagat tcctagcaag atcaaaactg
 121 accattaacc tacctctaca tccccctggc gccgttccag ggccaacgcc acattccctg
 181 ctgggcacgc aatggccgca ccccctcccg ctacagaagg ctcttttggt acacgcagtc
 241 cgaggtcgcc atggatcgga tgaagaagat caaacggcag ctgtcaatga cactccgagg
 301 gggccgaggc atagacaaga ccaatggtgt ccctgagcag ataggcctag atgagagtgg
 361 tggtggtggt ggcatgaccc ttggagaagc tcccacccgt gttgcccctg gggaacttcg
 421 ctctattcgg ggcccactca gctctgcacc aggtctacct gggtttccca gtctgctcta
 481 ggggccatgt acacaaatgg atacgatgaa gaaatatatt atattggggg aaagagagtg
 541 ttcttgactc caaaggcctg gcctttccct cactctgcac cagagattgt gcatgaagac
 601 atgaagatgg gatctgatgg ggagagtgac caggcttcag ccacatcctc agatgaggtg
 661 cagtctccag tgagagtgcg catgcgcaac caccccccac gcaagatctc cactgaggat
 721 atcaacaaat gcctgtcact accagctgac atacggctgc ctgagggcta ccttgagaag
 781 ctgaccctca atagccccat cggtgataag cctcttagcc ggcgcctccg gccagtcagc
 841 ttgtctgaga ttggctttgg aaaactggag acctacatca aactagacaa gctgggtgag
 901 ggtacctatg ccactgtcta caaaggcaaa agcaagctca cagacaacct tgtagcactt
 961 aaggagatca gactggaaca cgaagaaggg gcaccctgca ctgctatccg ggaagtatcc
1021 ctgcttaagg acctcaagca tgccaacatc gtcacactac atgacacttat ccacacagag
1081 aagtccctca cccttgtctt tgaatacttg gacaaggacc tgaagcagta cctggatgac
1141 tgtggaaatg tcatcaacat gcacaatgtg aaactgttcc tgttccagtt gctccgtggc
1201 ctggcctact gccacaggca gaaggtgcta caccgagacc tcaagcccca gaacctactc
1261 atcaacgaga ggggagagct caaactggca gactttggcc tggcttacgc caagtcaatt
1321 cctactaaaa catactccaa cgaagtggtg acactgtggt accggccccc tgacatctta
1381 cttgggtcca cagactactc cggccaaatt gacatgtggg gtgttggctg catctttat
1441 gagatggcca caggccggcc cctcttccca ggctccacag tggaagaaca gctgcacttc
1501 atcttccgca ttttgggaac cccaactgag gacacatggc caggtatcct gtccaatgaa
1561 gagtttagaa catacaacta ccccaagtac cgagccgagg cccttctgag gcatgcaccc
1621 cgacttgaat gcgatggagc tgacctcctc accaagctgc tgcagtttga gggtcgcaat
1681 cggatctctg ctgaggatgc catgaaacat ccattctttc tcagcttggg ggagcggatc
1741 cacaaacttc ctgacactac ttccatattt gcactaaagg aggtacagct acaaaaggag
1801 gccaacattc ggtccacttc tatgcctgac tcaggcaggc cagctttccg tgtggtggat
1861 accgagttct aagccaagtt ttaagccaca gacagaccaa ggccccagca ggcagcggct
1921 ggagggatgc cacacccctc acaggacagc ccccatctgc aatcctccct gcttgttgcc
1981 tgcttacctg cctgagccac actcccctgc caacttgtcc cctgccacct gtccaaacac
2041 cgaactactg gcctggcctg tcaacccaac cactggcctg tctgctgggt gctaacaaag
2101 ctctcaccac tactttgctt gatgtgtctg tctctgtctt ggtagatgct ggtggaccga
2161 atggccgtgc cagctttcca cactaaggct aggccttccc ctcttcatca cactctctcc
2221 caggaccact accccatggc cagccagggg tttggagcta gcccaggcca ggctcttaat
2281 cgactttgac tagaaggtag tgagtgatgc cttgggtctg agcatcattt gcctgcttcc
2341 cacctgtccc acttgcctct gttgtatggg cttttttta gtttctttta ttgttttttt
2401 attattttaa atgaggttct cacttttaa tgcaatatct ctgtatacag actggttggg
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FIGURE 20B

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2461 cactactccc tgagtgtggc actcccacag tattttgtgc aatgaagtcc cactcccacc
2521 ctttgagagg tagggaccca gaccctattc agatcctcac catcactaga ccctggaatt
2581 ggctatggga aagcatgcct cagccactca ccttcctccc ctacctagcg ttcccagcta
2641 taggggggacc tgagaactac cagagagtgg gagatggaca tggtggggcc tactttttcc
2701 ctccttcagt cccgtagcca gggcctcctt ccttctcagg gtcttcccca gcccagctct
2761 gcctagccct cctgccctgt cctactcggt gctgttgagt aggggctctg cctggaatcg
2821 agcagcttag tgaggagcca tatataatat gtgcacaagc aggaggacat gtgggagctt
2881 gtgcccaatt gttacacccc aatccctagg agggtcaggc aggccaagga cagtctcctg
2941 gatggatggt ttgctcccct tactccacct taagccttgg gacccttaag cagggtggga
3001 gggcaaggga gggtgccctc ctagtggggt ttgggggggat tgggttcctg aatgcaccat
          3061 aatcgctgta tgaaatatta aaaaaaagtc taaagtgaaa aaaaaaaaa a
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FIGURE 21

MDRMKKIKRQLSMTLRGGRGIDKTNGVPEQIGLDESGGGGGMTLGEAPTRVAPGELRSI
RGPLSSAPEIVHEDMKMGSDGESDQASATSSDEVQSPVRVRMRNHPPRKISTEDINKCL
SLPADIRLPEGYLEKLTLNSPIGDKPLSRRLRPVSLSEIGFGKLETYIKLDKLGEGTYA
TVYKGKSKLTDNLVALKEIRLEHEEGAPCTAIREVSLLKDLKHANIVTLHDIIHTEKSL
TLVFEYLDKDLKQYLDDCGNVINMHNVKLFLFQLLRGLAYCHRQKVLHRDLKPQNLLIN
ERGELKLADFGLAYAKSIPTKTYSNEVVTLWYRPPDILLGSTDYSGQIDMWGVGCIFYE
MATGRPLFPGSTVEEQLHFIFRILGTPTEDTWPGILSNEEFRTYNYPKYRAEALLRHAP
RLECDGADLLTKLLQFEGRNRISAEDAMKHPFFLSLGERIHKLPDTTSIFALKEVQLQK
EANIRSTSMPDSGRPAFRVVDTEF

FIGURE 22

MYTNGYDEEIYYIGGKRVFLTPKAWPFPHSAPEIVHEDMKMGSDGESDQASATSSDEVQ
SPVRVRMRNHPPRKISTEDINKCLSLPADIRLPEGYLEKLTLNSPIGDKPLSRRLRPVS
LSEIGFGKLETYIKLDKLGEGTYATVYKGKSKLTDNLVALKEIRLEHEEGAPCTAIREV
SLLKDLKHANIVTLHDIIHTEKSLTLVFEYLDKDLKQYLDDCGNVINMHNVKLFLFQLL
RGLAYCHRQKVLHRDLKPQNLLINERGELKLADFGLAYAKSIPTKTYSNEVVTLWYRPP
DILLGSTDYSGQIDMWGVGCIFYEMATGRPLFPGSTVEEQLHFIFRILGTPTEDTWPGI
LSNEEFRTYNYPKYRAEALLRHAPRLECDGADLLTKLLQFEGRNRISAEDAMKHPFFLS
LGERIHKLPDTTSIFALKEVQLQKEANIRSTSMPDSGRPAFRVVDTEF